Fertility Transition, Contraceptive Use, and Abortion in Rural Bangladesh: The Case of Matlab

Date: February 2000

Subcontractor: ICDDR,B
Project Name: The POLICY Project
Project Number: 936-3078
Prime Contract: CCP-C-00-95-00023-04
Subcontract Number: 5401.07.ICDD

Investigators: Mizanur Rahman, Ph.D., Pathfinder International
Julie DaVanzo, Ph.D., RAND
Abdur Razzaque, Ph.D., ICDDR,B

The POLICY Project is a five-year project funded by USAID/G/PHN/POP/PE. It is implemented by The Futures Group International in collaboration with Research Triangle Institute (RTI) and The Centre for Development and Population Activities (CEDPA).

For more information please contact:

The POLICY Project
The Futures Group International, Inc
1050 17th Street, Suite 1000
Washington, DC 20036
Telephone: (202) 775-9680
Facsimile: (202) 775-9694
E-mail: policyinfo@tfgi.com
Internet: www.policyproject.com

Preface

This report summarizes findings from a study in Bangladesh funded by USAID through The Futures Group International POLICY Project Global Research Award. We conducted a longitudinal study, for a period of 20 years, in two otherwise-comparable Matlab, Bangladesh, populations that differ in the accessibility and quality of family planning services. Our goal was to determine whether these differences in family planning services resulted in differences in abortion between the two areas.

We disseminated the findings of this research in three fora that enabled us to reach important national and international audiences of researchers, policy planners, and program personnel. A poster entitled "Do Better Family Planning Services Reduce Abortion? Evidence from Matlab, Bangladesh" (by Mizanur Rahman, Julie DaVanzo, and Abdur Razzaque) was presented at the annual meeting of the Population Association of America, Los Angeles, March 23-25, 2000. Appendix A shows copies of the items posted on the poster. The poster was visited by a number of interested participants, including John Bongaarts, Malcolm Potts, Charles Westoff, and others.

We made a presentation entitled "Do Better Family Planning Services Reduce Abortion? Evidence from Bangladesh and Russia" (by Julie DaVanzo and Mizanur Rahman) at a Congressional Breakfast Briefing, in Washington, DC, on April 14, 2000. The briefing was jointly organized by Population Resource Center and the Congressional Coalition on Population and Development [Co-Chairs: Connie A. Morella (R-MD) and Thomas C. Sawyer (D-OH]. Appendix B includes copies of the vugraphs we used in this presentation. In this same session, Dr. Charles Westoff presented findings from his studies of abortion in Central Asia**.**

A presentation, "Do Better Family Planning Services Reduce Abortion? Evidence from Matlab, Bangladesh" (by Mizanur Rahman, Julie DaVanzo, and Abdur Razzaque) was made at the Sasakawa International Auditorium of ICDDR,B, in Dhaka, Bangladesh, on May 3, 2000. Appendix C includes copies of the vugraphs from this presentation. The presentation was attended by about 35 population and health scientists, university professors, policy planners, government and NGO program managers, and development partners in Bangladesh. The findings were widely discussed and the policy planners found them useful for future policy formulation. After the presentation the ICDDR,B Director, Dr. David Sack, sent us a note " … This was one of the best seminars we have had at the Centre in a long time and I appreciate your sharing this information with us."

We plan for further dissemination of our findings. Appendix D shows an abstract of the paper "Fertility Transition, Contraceptive Use, and Abortion in Rural Bangladesh: The Case of Matlab" (by Mizanur Rahman, Julie DaVanzo, and Abdur Razzaque) that has been accepted for an oral presentation at the annual meeting of American Public Health Association to be held in Boston during November 12-16, 2000. We are also working on an article that we would like to publish in a peer-reviewed journal.

Introduction

In many populations it has been found that abortion has increased during the demographic transition. Over the last two decades in Bangladesh, for example, the contraceptive prevalence rate increased remarkably from about five percent in the early 1970s to 50 percent in the mid 1990s; the total fertility rate declined from about 7.0 children per woman to below 3.5 in the corresponding period; and the incidence of induced abortion increased. However, during this same period, in the Matlab comparison area the abortion ratio increased from below 15 abortions per 1,000 live births to about 50. To naive audiences, such correlations suggest that family planning (FP) programs may increase the incidence of abortion, whereas, in fact, it is likely that, ceteris paribus, better FP programs can reduce the incidence of abortion by reducing the number of unintended pregnancies. Given its rapid fertility transition, Bangladesh is an interesting setting for an investigation of the relationship between fertility transition and abortion.

It is difficult to find appropriate data for testing this hypothesis. The carefully designed family planning (FP) program in the treatment area of Matlab, the neighboring and otherwise similar comparison area (where the quality of FP services is relatively poor), remarkable fertility declines in both areas but a faster decline in the treatment area, and high-quality longitudinal data on a large number of women over a long period of time in both areas provide a unique opportunity for studying the impact of fertility transition and contraceptive use on abortion.

Previous research, in 1970s and 1980s, suggests that clandestine and unsafe abortion was quite common and a leading cause of maternal mortality and short- and long-term maternal health complications in Bangladesh . For example, around 20 percent of maternal mortality in the above

periods was due to unsafe abortion. Menstrual regulation (MR) services have been available since the late 1970s through government and other medical facilities with an aim of replacing the already existing practices of unsafe abortion. MR is typically done in a medical setting in the early stages of gestation, before pregnancy is clinically confirmed.

The overall objective of our study has been to examine the women's likelihood of abortion over last 20 years, especially the influence of the availability and quality of FP services on abortion. We have taken advantage of the unique data from Matlab, which enable us to examine this issue in settings that differ experimentally in the availability of FP services. This provides a much stronger test than the comparisons across not-very-similar areas or across time periods that have been made in other studies of this issue.

Methods and Materials

Four complementary, high-quality data sets from the Matlab Demographic Surveillance System (DSS) have been used. Our sample consists of 147,753 pregnancy outcomes, including 4,100 abortions (unsafe abortions and MR), during 1979-1998 (Table 1). Retrospective in-depth data, collected in 1984 (n=4,225) and 1990 (n=6,325), have been linked with the longitudinal information on pregnancy outcomes to conduct a prospective study of abortion. Both women's and pregnant women's risks of abortion (i.e., abortion rates and ratios) are considered. Logistic regression models have been used to estimate the net effects of hypothesized factors/behavior on abortion after statistically controlling for the effects of potentially confounding variables.

Results

The mean desired number of children was around 4.5 in both areas of Matlab in 1975 and declined to slightly over 3.0 in 1990 (Figure 1). In recent years, it has declined further to about 2.5, and desired fertility remained similar in the two areas. This confirms that the two areas are very similar in many key respects. Contraceptive use has increased in both areas but is higher in the treatment area than the comparison area. In 1990, about 60 percent of couples in the treatment area used a contraceptive method, compared with only half as many (30 percent) in the comparison area (Figure 2). Unmet contraceptive need has declined in both areas but has been substantially higher in the comparison area than in the treatment area (Figure 3). For example, in 1990 unmet contraceptive need was 11 percent in the treatment area compared with 27 percent in the comparison area. Unintended pregnancies have declined in both areas, but the decline has been steeper in the treatment area.

In the comparison area the general abortion rate (GAR) (annual number of abortions per 1,000 women) has increased from around 5 per 1,000 during 1979-82 to 6-7 in 1987 and afterward (Figure 4). In contrast, in the treatment area, the GAR declined from around 5 during 1979-82 to 2-3 after 1987. Similarly, the total abortion rate (TAR) (the number of abortions a woman would have in her lifetime if at each age she experienced the current age-specific abortion rate) has increased in the comparison area from around 0.15 per woman during the 1979-82 period to between 0.20 and 0.25 after 1987 (Figure 5). In contrast, the treatment area TAR was similar to that in comparison area during 1979-82 but declined to around 0.10 or below after 1987.

The increase of women's risk of abortion in the comparison area may seem surprising because,

with the increase of contraceptive use, more and more women are protected from unintended pregnancies resulting in lower abortion risks. Qualitative studies (e.g., by Sidney Schuler, Ruth Simmons, and Bruce Caldwell) have found, however, that the intensity of the desire to achieve the preferred number of children has increased in Bangladesh. Parents are much more concerned to achieve small families now than in the past because of ideational changes due to significant social and economic transformations in Bangladesh. It appears that the practice of abortion increased in the comparison area because there are still a lot of unmet contraceptive needs associated with the increased intensity of the desire to achieve a small family. Our data show that, in both areas of Matlab, the chance that a woman with an unintended pregnancy opts for abortion has increased – from below six percent to 10 percent or higher – and that it is similar in the two areas (Figure 6).

The reason why the overall abortion risk has declined in the treatment area in spite of the increased risk of abortion with unintended pregnancies is that the rates of unintended pregnancy are lower and have decreased more rapidly in the treatment area. Between 1984-88 and 1990-94, the unintended pregnancy rate declined from 16 to 11 percent in the treatment area and from 25 to 20 percent in the comparison area (Table 2). In the most recent data we have, the number of unintended pregnancies was almost half in the treatment area what it was in the comparison area, resulting in a lower level of abortion in the former area.

In the comparison area, the likelihood that a pregnancy is aborted increased continuously from around 2 abortions per 100 pregnancies during the 1979-82 period to over 5 in 1998. In the treatment area, the same likelihood was around 2.5 during 1979-82 and varied between that level to under 2 percent over the subsequent period (Figure 7). As noted above, our data show that unintended

pregnancy is declining in both areas and it is almost half in the treatment than comparison area. The almost static level trend in the treatment area in the likelihood that a pregnancy is aborted reflects the offsetting effects of (1) a falling number of unintended pregnancies due to high and more effective use of contraception and (2) an increasing probability that an unintended pregnancy will be aborted because of a stronger desire to reduce family size. In the comparison area, on the other hand, the increases in contraceptive use and reductions in the extent of unintended pregnancy have not been sufficient to offset the increasing probability that such pregnancies are aborted.

Women's age is an important factor associated with family-building strategies in Matlab. We find that the age pattern in the age-specific abortion rate is similar to that of the age-specific fertility rate: it increases with age reaching a maximum at ages 30-34, and then steadily declines thereafter (Figure 8). The abortion rate has been substantially and significantly lower at all ages, especially after age 25, in the treatment area than in the comparison area. The probability that a pregnancy is aborted, however, increases consistently with age in both areas, undoubtedly reflecting the fact that, as age increases, couples are more likely to have already reached their desired number of children (Figure 9). At all ages the probability that a pregnancy is aborted is lower in the treatment area than in the comparison area, and the difference in abortion probabilities between areas increases with age. For example, in the comparison area the probability that a pregnancy was aborted was below 3 percent before the age of 30 years, it increased to about 12 percent in ages 40-44, and to nearly 20 percent in ages 45-49. In the treatment area, by contrast, only 10 percent of pregnancies among women of age group 45-49 were aborted.

Among the socioeconomic factors associated with abortion, we found that educated couples

were more likely to opt for an abortion than their uneducated counterparts. Similarly, rich women were more likely to have an abortion than poor women. Such differentials are true when both women's and pregnant women's risks of abortion are considered (Table 3 and Table 4). These patterns are consistent with the notion that abortion is more likely when the costs of an unintended pregnancy are viewed as being high. Abortion was higher among those mothers who have achieved their favored gender composition of children: Abortion was also more common for women who had at least one or more than one son and at least one daughter than for those with other gender compositions.

Conclusions

Our study gives us an opportunity to observe longitudinally, for a period of over 20 years, two otherwise-comparable Matlab populations that differ in the accessibility and quality of family planning services. We find that the intensity to achieve a small family has increased equally in the two populations. Contraceptive use has increased in both, but more in the special project area that has better family planning services, resulting in fewer unmet needs of contraception and fewer unintended pregnancies in the treatment area than in the comparison area. Unintended pregnancies have declined in both areas but the lower level and slower decline of it, relative to the increase in the intensity to achieve a small family, in the comparison area has resulted in an increase in abortion. In contrast, abortion has declined in the treatment area due to a faster decline of unintended pregnancies. Widespread and effective contraceptive use associated with more accessible and better quality of family planning services in the treatment area has led to a decline in abortion. We conclude that abortion may increase with fertility transition in developing countries as the intensity to limit family size may increase rapidly unless there is widespread availability of family planning services of higher

quality to meet couples' needs for fertility control. The Matlab experiment is an example of carefully and appropriately designed family planning services that can effectively meet couples' need to space and limit their births.

In Bangladesh, unmet contraceptive need is still high (it was about 18 percent in 1996-97), but desire to limit family size continues to intensify. It is especially important now to help couples reach their desired level of fertility as they are very eager to achieve a small family. Family planning services should aim to reach couples who desire to regulate their fertility and to further improve quality to enable couples to effectively use contraception so that they can avoid an unintended pregnancy and thus an abortion.

Table 1. Numbers of Live Births, Stillbirths, Miscarriages, Abortions, and Women Aged 15-49, by Calendar Year and Area, Matlab, 1979-98

Calendar year	Comparison area					Treatment area				
	Live births	Miscarriages	Stillbirths	Abortions	Women	Live births	Miscarriages	Stillbirths	Abortions	Women
1979	4,058	283	174	60	26,692	3,128	230	127	94	28,158
1980	4,016	316	148	112	27,062	3,377	214	158	115	28,435
1981	3,953	300	149	107	27,758	3,264	227	140	120	29,230
1982	4,139	239	148	98	28,577	3,492	165	130	101	30,077
1983	4,028	277	143	79	28,896	3,303	171	116	50	30,606
1984	3,560	281	142	128	29,661	2,987	173	98	57	31,402
1985	4,046	285	142	116	29,312	3,360	173	110	39	31,550
1986	3,781	231	147	102	29,059	3,341	207	130	59	31,848
1987	3,827	267	158	130	29,977	3,383	186	134	67	32,764
1988	3,960	248	122	138	30,131	3,159	171	117	81	33,315
1989	3,610	233	117	152	30,275	2,936	149	81	70	33,685
1990	3,750	270	129	161	30,535	2,955	182	106	79	33,898
1991	3,293	217	126	147	30,671	2,664	197	95	78	34,029
1992	3,137	247	129	160	32,203	2,661	182	83	77	34,298
1993	2,996	205	141	144	30,790	2,616	165	98	73	34,739
1994	3,018	194	134	161	33,208	2,747	153	90	58	35,939
1995	2,861	187	119	143	32,425	2,679	137	77	44	35,369
1996	2,777	158	79	149	33,208	2,404	132	89	75	35,939
1997	2,800	177	108	191	33,972	2,665	156	87	56	36,758
1998	2,998	163	114	170	34,542	2,827	137	77	59	37,349
Total	**70,608**	**4,778**	**2,669**	**2,648**		**59,948**	**3,507**	**2,143**	**1,452**	

Table 2. Number of Unintended Pregnancies per 100 Women, by Area, 1984-88 and 1990-94

Area	**1984-88**	**1990-94**	**% decline**
Comparison	25	20	22
Treatment	16	11	32

Table 3. Logistic Regression Coefficients: *Women's* Risk of Abortion, Matlab, 1984-88 and 1990-94

	1984 (n=3,912)		1990 (n=6,327)	
Independent variables	Model 1	Model 2	Model 1	Model 2
Maternal age	0.5452*	0.5464*	0.2733*	0.2746*
Maternal age squared	-0.0092*	-0.0093*	-0.0047**	-0.0047**
Number of living children	0.0229	0.0332+	0.1998**	0.2030**
Maternal years of schooling	0.0950+	0.0925	0.0655+	0.0654+
Husband's years of schooling			0.0737**	0.0731**
Do not want more children (DNW)	0.8198*	0.5267	0.6735**	0.4939+
Treatment area (TA)	-1.3211***	-1.9774**	-0.7419***	-1.0992**
DNW*TA		0.9336		0.4876
Constant	-12.122	-11.9575	-8.8453	-8.7391
-2 Log likelihood	452.044	450.393	1207.878	1206.500

+P<0.10, *P<01, **P<0.01, *** P<0.001

Table 4. Logistic Regression Coefficients: *Pregnant Women's* Risk of Abortion, Matlab, 1984-88 and 1990-94

	1984 (n=2,436)		1990 (n=3,249)	
Independent variables	Model 1	Model 2	Model 1	Model 2
Maternal age	0.0475	0.0462	0.0801***	0.0788***
Number of living children	-0.0475	-0.0344	0.1072	0.1163+
Maternal years of schooling	0.1287*	0.1272*	0.1015*	0.0999*
Husband's years of schooling			1.1041***	0.1038***
Do not want more children (DNW)	1.0992**	0.7313	1.2865***	0.9252**
Treatment area (TA)	-1.1914**	-1.9777**	-0.4296*	-1.0650**
DNW*TA		1.1333		0.9122*
Constant	-5.437	-5.1999	-6.9685	-6.7044
-2 Log likelihood	407.715	405.279	922.243	917.567

+P<0.10, *P<01, **P<0.01, *** P<0.001